Type 2 diabetes mellitus (T2DM) is becoming a global epidemic, with an ongoing decline in the age of onset. Type 2 diabetes is one of the leading public health concerns of the 21st century, with a worldwide prevalence of over 8.5%. According to the International Diabetes Federation (IDF), approximately 537 million adults between the ages of 20 to 79 years had diabetes mellitus in 2021. DM is proving to be a global public health burden as this number is expected to rise to another 200 million by 2040.[1]The American Diabetes Association identifies diabetes mellitus as a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action or both. which is highly prevalent in the general population, and even a situational affliction becomes fatal, but the presence of psychological comorbid factors is also seen increasing day by day among such individuals. Many times, as a primary or secondary psychological disturbance in type 2 diabetes mellitus. Usually, psychological comorbidities include anxiety, depression, stress, and multiple psychologically vulnerable entities. Besides other comorbidities are also present, which makes diabetes is a highly challenging situation to manage successfully. Several pathogenic actions are involving the development of diabetes. The basis of the abnormality is the deficiency of insulin, which affects the metabolism of carbohydrates, fats, and proteins. The deficiency in insulin action results from inadequate secretion and a diminished tissue response to insulin.[2]

We call it a hyperglycaemia (increased blood sugar level) condition. Many of the associated symptoms, such as polyuria, polydipsia, polyphagia, weight loss, sometime blurred vision, and even impairment of growth and susceptibility to certain infections, may accompany chronic hyperglycaemia.[3]

Diabetes mellitus has caused significant morbidity and mortality due to microvascular (retinopathy, neuropathy, and nephropathy) and macrovascular (heart attack, stroke and peripheral vascular disease) complications.

Other long-term complications may precipitate retinopathy with loss of vision, nephropathy leading to renal failure, peripheral neuropathy causing foot ulcers, amputations, Charcot joints, autonomic neuropathy causing gastrointestinal disease, cardiovascular disease, and sexual dysfunction[4].

There is a vast majority of cases of diabetes with two broad etiopathogenesis categories: type 1 diabetes mellitus and type 2 diabetes mellitus. Type 1, "Juvenile Diabetes Mellitus" (Insulin Dependent Diabetes Mellitus). Type 1 occurs in childhood, mainly due to destruction of pancreatic β-cell islets through autoimmune-mediated, resulting in absolute insulin deficiency. T1DM (type 1 diabetes mellitus) causes an absolute deficiency of insulin secretion. Those individuals who are at high risk of developing type 1 diabetes can often identify serological evidence of an autoimmune pathological process occurring in the pancreas by high genetic markers.[5]

Type 2 diabetes mellitus and, "Adult type" (Non-Insulin Dependent Diabetes Mellitus). it more prevalent category where cause is accomplishing resistance insulin action an in adequate compensatory Insulin secretes response in such type of diabetes degree of hyperglycaemia insufficient to cause pathological and functional changes in various target tissues even certain individuals due to absence of clinical symptoms it may be undetected form of prolonged period. Type 2 is more associated with an adulthood and elderly people, which are mainly due to insulin resistance or abnormal insulin secretion. Even during such asymptomatic period there is possibility to demonstrate abnormality carbohydrates, metabolism unpleasant glucose in fasting state is often a challenge with over glucose load.[6]

The diagnostic criteria, harking back to the American Diabetic Association (ADA) guidelines of 1997 and the World Health Organization (WHO) National diabetic group criteria of 2006, involve identifying a single elevated glucose reading accompanied by symptoms such as polyuria, polydipsia, polyphagia, and weight loss. Alternatively, the criteria consider raised values on two occasions, whether through fasting plasma glucose (FPG) ≥7.0 mmol/L (126 mg/dL) or, during an oral glucose tolerance test (OGTT), a plasma glucose ≥11.1 mmol/L (200 mg/dL) two hours after the oral dose.[7]

This increasing prevalence, particularly of type 2 diabetes and T2DM has evolved into a global epidemic, and its prevalence has reached unprecedented levels in the 21st century. The International Diabetes Federation (IDF) estimates that over 537 million people were living with diabetes worldwide in 2021[2]. The number of people with type 2 DM is increasing in every country with 80% of people with DM living in low- and middle-income countries. In 2017, the number of diabetics worldwide by region is reported as follows: Western Pacific (159 million), Southeast Asia (82 million), Europe (58 million), North America and Caribbean (46 million), Middle East and North Africa (39 million), South and Central America (26 Million) and Africa (16 million) .Most of these cases were T2DM, accounting for approximately 90% of all diabetes cases. India bears a substantial burden, with over 70 million individuals affected by the disease. Diabetes prevalence is on the rise in both developed and developing nations, driven by sedentary lifestyles, dietary changes, and aging populations.[8]

The incidence of T2DM (type 2 diabetes mellitus) is rising at an alarming rate, with an estimated 10% increase in global prevalence every decade[4]. Notably, T2DM is no longer restricted to adulthood; a disturbing trend is the emergence of this condition in adolescents and even children, reflecting shifts in lifestyle and dietary habits.[9]

Diabetes is more than just a metabolic disorder; it is a complex condition that deeply affects individuals' physical, emotional, and psychological well-being. Patients living with T2DM (type 2 diabetes mellitus) often experience elevated levels of stress due to the demands of disease management, such as dietary restrictions, medications, and regular blood glucose monitoring. This chronic stress can contribute to anxiety and depressive symptoms, impacting the overall quality of life. Additionally, the fluctuation in blood glucose levels can affect mood and exacerbate psychological symptoms.

Anxiety and depression are among the most common comorbid mental health conditions associated with T2DM (type 2 diabetes mellitus). The intricate interplay between these psychological disorders and T2DM (type 2 diabetes mellitus) is complex and multifaceted[7]. Existing literature suggests that patients with T2DM are at a significantly higher risk of experiencing symptoms of anxiety and depression compared to the general population.

The presence of these psychological symptoms in T2DM can have profound implications, affecting disease management, adherence to treatment, and overall health-related quality of life.[10] T2DM (type 2 diabetes mellitus) can manifest at various stages of life, including early-onset and late-onset forms. Early-onset T2DM typically occurs before the age of 45 and may be influenced by genetic factors. In contrast, late-onset T2DM occurs after the age of 45 and is often associated with lifestyle and environmental factors. These distinctions in onset may contribute to differences in the psychological and stress-related experiences of patients. It is crucial to examine whether early-onset and late-onset T2DM (type 2 diabetes mellitus) patients exhibit varying levels of anxiety, depression, stress.

The confluence of diabetes mellitus type 2 and the co-occurrence of mental health challenges, specifically anxiety, depression, and stress, has become an increasingly prominent area of concern within the realm of healthcare. This intricate interplay between physiological and

psychological dimensions not only impacts the well-being of individuals living with diabetes but also presents a substantial challenge to healthcare providers in their quest to provide comprehensive patient care.

Type 2 diabetes diagnosed in early adulthood is termed early-onset type 2 diabetes. Cases of early-onset type 2 diabetes are increasing rapidly globally, alongside rising obesity. Compared with a diagnosis later in life, an earlier-onset diagnosis carries an unexplained excess risk of microvascular complications, adverse cardiovascular outcomes, and earlier death.[11]

Early onset diabetes, characterized by the development of diabetes at a younger age, poses significant health challenges with diverse implications. Research indicates that genetic predisposition, coupled with lifestyle factors such as obesity, gestational diabetes, polycystic ovary syndrome (PCOS), and low birth weight, sedentary behaviour, and poor dietary choices, contributes to the elevated risk of developing diabetes at an early stage. [12]

The complications associated with early onset diabetes are manifold, encompassing cardiovascular issues, kidney disease, eye complications, nerve damage, and foot problems. Beyond the physical ramifications, there is a growing body of evidence linking early onset diabetes to adverse mental health outcomes. Studies suggest a bidirectional relationship between diabetes and mental health issues, with diabetes impacting mood regulation and individuals with diabetes experiencing higher rates of depression, anxiety, and stress.

The constant vigilance required for blood sugar management, fear of complications, and the chronic nature of the condition contribute to the psychological burden. Biological, psychosocial, and hormonal factors interplay in this relationship, emphasizing the need for a comprehensive, integrated approach to diabetes care that addresses both the physical and mental aspects. The importance of medical management, lifestyle modifications, and

psychological support cannot be overstated in mitigating the impact of early onset diabetes on individuals' overall well-being. Almost half of adults aged 20–45 years with Type 2 diabetes reported high levels of perceived stress and depressive symptoms, while a quarter reported high diabetes distress. The prevalence of emotional problems was higher among women and among some groups of lower socio-economic status (A. Bo, F. Pouwer et.al 2019).[13]

Late onset diabetes, often Type 2 Diabetes Mellitus (T2DM) diagnosed in middle adulthood, comes with a set of risk factors and complications that can significantly affect mental health. The risk factors include age, genetics, sedentary lifestyle, poor diet, hypertension, and ethnicity, collectively contributing to the vulnerability of developing diabetes later in life.

Complications associated with late onset diabetes range from cardiovascular issues, neuropathy, nephropathy, and retinopathy. The chronic nature of the condition, coupled with the potential for severe health issues, creates a profound impact on mental health. Individuals with late onset diabetes may grapple with feelings of depression due to the challenges of managing a lifelong condition, anxiety about health and potential complications, and stress arising from lifestyle changes and medication adherence. The fear of the unknown, societal misconceptions, and potential social isolation further compound the mental health impact. Recognizing and addressing the mental health aspects of late onset diabetes is essential, necessitating comprehensive care that considers both the physical and emotional dimensions of individuals navigating this complex condition.[14]

The co-occurrence of diabetes and depression often extends to include comorbid anxiety disorders, such as generalized anxiety disorder (GAD), panic disorder, or posttraumatic stress disorder (PTSD). It is noteworthy that anxiety disorders can manifest in individuals with diabetes, both with and without concurrent depression. The interplay between anxiety and

diabetes presents complex challenges, particularly during key periods such as the initial diagnosis of diabetes and the onset of complications.

The intersection of anxiety disorders with diabetes introduces complications in managing the condition in several ways.

Firstly, serious anxiety disorders share significant symptomatology with hypoglycaemia, blurring the lines for individuals with diabetes trying to distinguish between anxiety-induced sensations and actual symptoms of low blood glucose that necessitate immediate treatment. This overlap can lead to challenges in timely and accurate responses to glycemic fluctuations.

Secondly, preexisting anxiety related to medical procedures, such as injections or blood draws, may escalate into severe anxiety or panic disorders when an individual is diagnosed with diabetes. The fear and anxiety associated with the necessary aspects of diabetes management can significantly impact a person's mental well-being and their ability to adhere to treatment plans.

Lastly, the fear of hypoglycaemia, a common concern for individuals with diabetes, can become a source of severe anxiety. This fear may drive some patients to maintain blood glucose levels above the recommended targets, potentially compromising their overall diabetes management.[15]

Depression can affect anyone, research indicates a heightened risk among individuals with type 2 diabetes mellitus compared to the general population. Studies have consistently demonstrated that the prevalence of depression in individuals with type 2 diabetes is approximately two-fold higher than in those without diabetes. This association between depression and type 2 diabetes suggests a complex interplay between the physical and mental aspects of health. The

relationship between depression and Type II diabetes is complex and bidirectional, with each condition influencing and potentially exacerbating the other.[16]

Diabetes is a chronic condition requiring a strict treatment regimen that includes medication adherence, dietary modifications, and regular physical activity. The management of diabetes is further complicated by the potential for various complications, such as macro- and micro-vascular diseases, neuropathy, and nephropathy.

The chronic nature of diabetes and the multifaceted demands of its treatment can pose a substantial psychological burden on individuals. The strict regimen, potential complications, economic burden, comorbidities, and the risk of increased mortality collectively contribute to the emotional distress experienced by patients with diabetes. These factors can become triggers for or contribute to the development of depression in individuals with diabetes.[17]

Conversely, depression itself can act as both a cause and a consequence of hyperglycaemia. Depressed individuals may struggle with adherence to the necessary lifestyle modifications, such as dietary restrictions and regular physical activity, which are crucial components of diabetes management. Additionally, depressed individuals with type 2 diabetes often exhibit poorer adherence to medication regimens, leading to challenges in metabolic and glucose control. This non-adherence can exacerbate diabetic complications, worsen disease severity, and increase healthcare expenditures.

The interplay between depression and type 2 diabetes is further characterized by a detrimental impact on the quality of life for affected individuals. Depressed patients with diabetes often experience worsened adherence to dietary plans, medications, and physical activity, leading to a cascade of negative effects on metabolic control and glucose regulation. This, in turn,

contributes to increased severity of diabetic complications, placing a strain on healthcare resources and lowering overall patient well-being.[18]

The mental health implications of this chronic stress are significant. Depression, anxiety, and stress not only adversely impact the psychological well-being of individuals but also have a direct and negative influence on physical health. Stress, for instance, can contribute to elevated blood glucose levels, potentially undermining the very health goals individuals with diabetes strive to achieve. During periods of psychological stress, the body activates counter-regulatory hormones, including dopamine (a neurotransmitter), glucocorticoids, growth hormones, and glucagon. These hormones play a crucial role in the body's stress response. However, their activation has significant implications for individuals with diabetes.[19]

One of the primary effects of these counter-regulatory hormones is to hinder the normal functioning of insulin, a hormone responsible for regulating blood glucose levels. Insulin facilitates the uptake of glucose by cells, thereby lowering blood glucose levels.

However, when counter-regulatory hormones are activated during stress, they interfere with insulin's action, leading to an increase in blood glucose levels.

This disruption in metabolic regulation poses challenges for individuals, particularly those with diabetes. Elevated blood glucose levels make it more difficult to maintain optimal metabolic control. In patients with diabetes, this dysregulation is particularly concerning because they already grapple with the need for precise management of their blood glucose levels.[20]

The interplay between stress-induced activation of counter-regulatory hormones, poor glycaemic control, and functional impairment due to diabetes complications creates a complex relationship. Chronic stress, coupled with the challenges of managing diabetes, can lead to

suboptimal glycaemic control. Persistent high blood glucose levels, in turn, contribute to functional impairment and an increased risk of developing diabetes-related complications.[21]

Importantly, the bidirectional relationship between diabetes and mental health becomes apparent. On one hand, the stress response hampers metabolic regulation, aggravating diabetes-related challenges. On the other hand, the burdens of poor glycaemic control and the development of complications may induce or exacerbate depression and anxiety in individuals with diabetes.

This comparative study embarks on a journey to unravel the complex relationships between diabetes mellitus type 2, anxiety, depression, and stress, with a particular focus on discerning disparities between patients who experienced early onset diabetes and those who developed the condition later in life.

his demarcation in disease onset is pivotal, as it may hold the key to understanding the differential impacts of type 2 diabetes on mental well-being and stress levels.[22]

Policies:

If we go through the government policies, certain settled steps have been taken by the Indian government. For instance, under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PMJAY), its main steps are a population-based initiative for prevention control and screening for concern, as it is of course a non-communicable disease (NCD) but needs immediate intervention to not leave unattended. Besides, the government is arranging either free medicines or supplies of anti-diabetes at very subside rates to the needy population under the free drug service initiative (NHM). All these efforts reflect that this is the thrust area for research so that the concerned patients can be helped and supported.[23]

By delving into these specific distinctions, our research aims to contribute nuanced insights into the psychological and emotional dimensions of individuals with type 2 diabetes, facilitating a deeper understanding of the holistic challenges they face. Our exploration holds the promise of not only enhancing the quality of care provided to these patients but also of advancing our comprehension of the intricate relationship between metabolic health and emotional well-being. In doing so, we aspire to pave the way for more effective, tailored interventions that can address the unique needs of patients based on the timing of their diabetes onset.

In this study some important concepts are applied which are needed to be defined operationally.

Anxiety: In this study, anxiety refers to a psychological condition characterized by excessive worry, restlessness, and nervousness, often accompanied by physical and physiological discomforts.

Depression: Depression is a mood disorder characterized by persistent feelings of sadness, hopelessness, and a lack of interest or pleasure in daily activities. It happens among those who are careless about their sugar level / remains neglected / undetected as a result they may lose future hopes of wellbeing.

Stress: Stress is operationalized as a state of emotional or psychological strain & imbalance resulting from poor coping with challenging situations. It can manifest in various forms, including acute stress and chronic stress usually. Such conditions may be noticeable in both the group (whether early and late onset).[24]

Diabetes: Diabetes, in the context of this study, refers to a chronic metabolic condition characterized by elevated blood sugar levels due to the body's inability to produce enough insulin or effectively use the insulin it produces. Patients with diabetes may require lifestyle modifications, medication, or insulin therapy to manage their blood sugar level.

Type 2 Diabetes Mellitus: Type 2 diabetes mellitus means a chronic metabolic disorder characterized by high blood sugar levels due to insulin resistance and inadequate insulin production. Patients with a medical diagnosis of type 2 diabetes are included in the study.

Early Onset Diabetes: Early onset diabetes is referred to individuals those are diagnosed with type 2 diabetes before the age of 45. This age threshold used to categorize and compare the has been experiences of this subgroup.

Late Onset Diabetes: Late onset diabetes is defined as individuals who are diagnosed with type 2 diabetes at the age of 45 or older. This age cutoff employed to distinguish this has been subgroup from the early onset group.[25]

Scope of study:

This study focuses on differentiating between early-onset and late-onset Type 2 Diabetes by investigating the potential influence of diabetes onset on mental health outcomes. Often, psychological comorbidities become maintaining/perpetuating factors for diabetic patients. When comparing the consequences, it is evident that both early onset and late onset of diabetes can lead to fatal outcomes. Therefore, both groups need attention from a management perspective. While early onset may have a better prognosis, it is crucial not to overlook late onset, necessitating a comprehensive approach. This study specifically delves into anxiety, depression, and stress among individuals with Type 2 Diabetes at both early and late onset stages. The findings of this research have significant implications for doctors, caretakers, family members, and mental health professionals, guiding them on how to care for diabetic patients regardless of the onset timing. From an intervention standpoint, this research module involves interdisciplinary collaboration, where medical and mental health professionals are equally engaged. The results are expected to hold prime importance, providing insights that could serve as guidelines for further investigations.

The review of literature is an indispensable component of this thesis, serving as the cornerstone upon which the research is constructed. It provides the contextual framework within which the study unfolds, offering a comprehensive exploration of existing knowledge, research, and scholarly insights pertinent to the subject matter.

In the following pages, this review will undertake the task of synthesizing and evaluating a wide spectrum of academic works, research studies, and expert opinions that collectively contribute to a deeper understanding of the complex interplay between diabetes mellitus type 2, mental health conditions (specifically, anxiety, depression, and stress), and the timing of diabetes onset, comparing early onset and later onset. Initially review is based on western studies & it will be culminated with Indian studies.

Western studies

Mingqi Wang et.al (2023) Conducted on Comparison of clinical characteristics and disease burden between early- and late-onset type 2 diabetes patients: a population-based cohort study. study results indicate that patients with newly diagnosed early-onset T2D had earlier comorbidities of hypertension and hyperlipidaemia. Both clinical characteristics and treatment patterns suggest that the degree of metabolic disturbance is more severe in patients with early-onset type 2 diabetes. This highlights the importance of promoting healthy diets or lifestyles to prevent T2D onset in young adults.[26]

Shengxin Liu et.al (2022) Researched on Early-Onset Type 2 Diabetes and Mood, Anxiety, and Stress-Related Disorders. Founded that early-onset type 2 diabetes is associated with a higher risk of unipolar depression, bipolar disorder, anxiety, and stress-related disorders. These psychiatric disorders demonstrated familial liability with type 2 diabetes, mainly attributed to

genetic factors. Research findings highlight the need for clinical vigilance for mental health burden in people with early-onset type 2 diabetes.[27]

Baizid Khoorshid Riaz et.al (2021) Studied on Risk of Depression among Early Onset Type 2 Diabetes Mellitus Patients. Hospital Anxiety and Depression Scale (HADS) was used to screen all patients for psychiatric manifestation. Those diagnosed by HADS were subsequently reassessed using structured clinical interview for DSM-5 Disorders – Clinician Version. T2DM diagnosed at age <45 years were considered as early onset T2DM. Founded Early onset T2DM patients are at greater risk of developing depression. The finding is likely to help in setting preventive strategies aiming to reduce the presence of concomitant depression symptoms among diabetes.[28]

Naicker et.al (2018) Depression and Anxiety in Type 2 Diabetes: Associations with Diabetes Onset, Clinical Management, and Long-Term Mortality. Founded that body of work suggests that both depression and anxiety may result in poorer diabetes outcomes in men across all key stages, while symptoms of anxiety may provide protection against diabetes onset and risk of mortality in women with Type 2 diabetes.[29]

A. Bo et al. (2019) Studied Prevalence and correlates of diabetes distress, perceived stress and depressive symptoms among adults with early-onset Type 2 diabetes: cross-sectional survey results. A cross-sectional survey was performed among individuals with Type 2 diabetes aged 20-45 years who were included in the Danish nationwide Danish Center for Strategic Research in Type 2 Diabetes cohort between 2010 and 2016. The survey assessed diabetes distress (20-item Problem Areas in Diabetes Scale), perceived stress (10-item Perceived Stress Scale) and depressive symptoms (10-item short form of the Center for Epidemiological Studies

Depression Scale Revised), as well as socio-demographic characteristics. They found a high prevalence of emotional problems among adults with early-onset Type 2 diabetes in Denmark. Health care for this group should focus on both physical health and psychosocial circumstances and should also address general as well as diabetes-specific emotional problems .[30]

Mijung Park et.al (2016) Researched on Depression among older adults with late onset diabetes mellitus. Founded that DM and depression is frequently comorbid in older adult patients. Considering the negative synergistic effects on range of health outcomes resulted by comorbid depression and DM, prevention and early treatment of comorbid depression are a critical component of successful health management in older adult patients with DM.[31]

Abdulbari Bener (2017) Researched on Association between Depression, Anxiety and Stress Symptoms and Glycaemic Control in Diabetes Mellitus Patients.: A cross-sectional study conducted from February 2016 to January 2017. Of the total 1,600 diabetic patients approached, 1,147 (71.6%) gave their consent. Data analysis included, sociodemographic, blood pressure and glycated haemoglobin (HbA1c) and the Depression Anxiety Stress Scales (DASS)-21 and Beck Depression Inventory (BDI-II). Founded depression, anxiety and stress symptoms are strongly affecting glycaemic HbA1c control in DM patients.[32]

Dunja Degmecić et.al (2014) studied on Depression, anxiety and cognitive dysfunction in patients with type 2 diabetes mellitus--a study of adult patients with type 2 diabetes mellitus. cross sectional study, sample consisted of 108 patients, 66 of the patients were diagnosed with Type 2 Diabetes mellitus, and 42 were control group. All of them were interviewed by psychiatrist and tested through clinical interview with Hamilton depression rating scale, Hamilton Anxiety rating scale, Mini mental state examination and questionnaire about sociodemografic data. Founded high prevalence of psychiatric disorders in diabetic patients

points to the need for greater investment in appropriate diagnostic evaluation of patients that consider mental issues. [33]

J. L. Browne et.al (2014) conducted Depression, anxiety, and self-care behaviours of young adults with Type 2 diabetes: results from the International Diabetes Management and Impact for Long-term Empowerment and Success (MILES) Study. results suggest that Type 2 diabetes is as challenging as Type 1 diabetes for young adults and more so than for older adults. Young adults with Type 2 diabetes may require more intensive psychological and self-care support than their older counterparts.[34]

Emma Wilmot et.al (2014) Researched on Early onset type 2 diabetes: risk factors, clinical impact, and management. Founded Early onset T2DM is complex and impacts on service delivery with a need for multidisciplinary care of complications and comorbidities', in addition to adequate educational and psychological support. This review on the impact of early onset T2DM provides the latest insights into this emerging epidemic.[35]

Kaur et al. (2013) was done to determine the prevalence and predictors of depression, anxiety and stress symptoms in Type II diabetics attending government primary care facilities in the urban area of Klang Valley, Malaysia. A Sample of 2508 eligible consenting respondents participated in this research. The Depression, Anxiety and Stress Scale (DASS) 21 questionnaire was used to measure depression, anxiety and stress symptoms. It was revealed in the investigation that prevalence of depression, anxiety and stress symptoms was high among Type II diabetics, with almost a third being classified as anxious.[3]

Kellee Poulsen et.al (2011) studied on Depression and Anxiety in Older and Middle-aged Adults with Diabetes. A total of 224 participants completed a range of questionnaires measuring depression, anxiety, and diabetes-related emotional distress (if applicable). One hundred and three adults with diabetes (55 middle-aged, mean age = 47 years, range 40–59 years and 48 older, mean age = 69 years, range 60–81 years) were recruited from a tertiary diabetes clinic. Older adults with diabetes had significantly lower levels of depression, anxiety, and diabetes-related distress than middle-aged adults with diabetes. Diabetes is associated with high rates of depression and anxiety, with middle-aged adults more adversely affected than older adults.[37]

Ali Khan Khuwaja et.al (2010) conducted research on Anxiety and depression among outpatients with type 2 diabetes: A multi-centre study of prevalence and associated factors. The study identified that a large proportion of adults with diabetes had anxiety and/or depression, and identified factors associated with these entities. These results alert clinicians to identify and treat anxiety and depression as common components of diabetes care.[38]

Anne Engum et.al (2007) Conducted on the role of depression and anxiety in onset of diabetes in a large population-based study. Diabetes did not predict symptoms of depression or anxiety. Founded Symptoms of depression and anxiety emerged as significant risk factors for onset of type 2 diabetes independent of established risk factors for diabetes, such as socioeconomic factors, lifestyle factors, and markers of the metabolic syndrome. The comorbidity between depression and anxiety may be the most crucial factor.[39]

L A Palinkas et.al (2004) Researched on A prospective study of late onset Type 2 diabetes and depressive symptoms in the elderly. 971 men and women aged 50 and older from the adult population of Rancho Bernardo, California had an oral glucose tolerance test and completed the Beck Depression Inventory (BDI) at two clinic visits. Founded Depressed mood is more likely to be a risk factor for Type 2 diabetes in older adults than the reverse.[40]

Teresa A. Hillier et.al (2003) was done Complications in Young Adults with Early-Onset Type 2 Diabetes. Characteristics of an Adult Population with Newly Diagnosed Type 2 Diabetes To determine whether adults diagnosed with type 2 diabetes at 18±44 years of age (early type 2 diabetes) have different metabolic profiles at diagnosis than adults diagnosed at <45 years of age (usual type 2 diabetes). Conclude Although both onset groups were on average obese, the inverse linear relationship of obesity and age of diabetes onset that we observed suggests that obesity is a continuous risk rather than a threshold risk for diabetes onset. Both onset groups had a high prevalence of cardiovascular disease risk factors.[41]

Mark Peyrot et.al (1996) conducted research on Levels and Risks of Depression and Anxiety Symptomatology Among Diabetic Adults. To determine levels of depression and anxiety symptoms among adults with diabetes and identify factors associated with increased risk. Founded the Diabetes is associated with increased risk of psychological disturbance, especially for those with more diabetes-related complications. [42]

A. Palinkas et.al (1991) Studied on Type 2 Diabetes and Depressive Symptoms in Older Adults: a Population-based Study the prevalence of depressive symptoms and its association with Type 2 (non-insulin- dependent) diabetes was examined in a population-based study of 1586 men and women aged 50 years or older. The number of other chronic conditions and age were significant independent predictors of depressive symptoms in all diabetic men and

women. Results suggest that depressive symptoms in individuals with Type 2 diabetes may be related to awareness of diabetic condition in addition to poor health.[43]

Indian studies

Kasturi Hazarika et.al (2023) studied on Assessment of depression, anxiety, and stress among patients with type II diabetes mellitus attending a tertiary care centre. A cross-sectional study was conducted in a diabetes clinic of a tertiary care facility in North India. Hindi version of DASS 21 was used to ascertain the psychological health of patients which determine the presence of depression, anxiety, and stress. The study depicted a high rate of prevalence of psychiatric morbidity among the diabetic study population. It showed significant sex predilection, especially for depression, and predilection towards the rural population, among the uneducated and the economically backward.[44]

Vidyulatha, Jayaram (2022) Researched on Association of Stress, Depression and Anxiety among Individuals with Microvascular Complications in Type 2 Diabetes. Founded that female had a higher percentage of stress, depression, and anxiety compared to males. Secondly, individuals with microvascular complications showed a higher prevalence of stress and depression. Finally, there was an association between retinopathy, nephropathy, and neuropathy with stress and depression, while anxiety was associated with neuropathy alone.[45]

Depali Mathur et.al (2020) research conducted on Depression in High-Risk Type 2 Diabetes Adults. A total of 1,606 adults were recruited for the study. A patient health questionnaire was used to determine the depression on the basis of score. Founded 29.1% of diabetes individuals had minimal depression, 38.7% had mild, 17.2% moderate, 12.0% moderately severe, and 3.1% had severe depression. This study also found that there is a positive association between depression and uncontrolled diabetes in male gender.[46]

Priyanshu Jain (2020) et.al studied on Depression and Anxiety among Adult Patients with Type II Diabetes Mellitus. This was a cross-sectional study which was conducted at Urban Health Centre (UHC) for a period of two months. One hundred and twenty-six individuals diagnosed with Type II DM for a year were recruited as study participants (18-60 years of age). All the study participants were interviewed personally by the investigator at the UHC or their residence. Founded that Among the sleep deprived and reduced appetite cases, anxiety levels were significantly high indicating several factors playing a role in development of psychological problems.[47]

Parameshwari et.al (2018) Researched on Depression, Anxiety and Stress level in patients with diabetes mellitus. The Study design was a case control Study. The study included 30 type 2 diabetic patients and 30 age- and gender-matched healthy participants. To assess the depression, anxiety, and stress levels, DASS 42 scale was used. The current study suggests that there are higher levels of depression, anxiety, and stress symptoms in diabetic population when compared with healthy controls. study recommend further detailed studies in this area for better understanding of the association and recommend psychological support in the management plan of diabetes.[48]

Rajangam et.al (2018) researched on the frequency of depression in patients by type II diabetes. The study involving hundred T-II Diabetes mellitus patients over the age of 40 with the Hamilton's Depression Scoring's questionnaire was used to assess their depression level. The result showed a statistically associated in patients between depression and diabetes regulation. The study indicates that the proportion of depression in type 2 is high.[49]

P Dahal et.al (2017) conducted study on A descriptive study was conducted on Diabetes Mellitus occurrence and determinants of depression adult population in Bangalore. The study sample consisted of 100 diabetes mellitus patients. The study indicate that depression is widespread among patients with diabetes mellitus was nine per cent. In conclusion is that among diabetes mellitus patients' depression is common co-morbidity.[50]

Amit Thour et.al (2015) researched on Depression among patients with diabetes mellitus in North India. The study was cross-sectional carried out in endocrinology clinic of tertiary care hospital in North India. Cases were patients with type 2 diabetes mellitus (T2DM) above 30 years of age. Depression was assessed using the patient health questionairre-9 (PHQ-9).The study found a high prevalence of depression among patients with diabetes. Rural individuals are more depressed than the urban ones. Age, sex, duration of diabetes, microvascular complications, hypertension, were not significantly associated with depression.[51]

Madhu et al. (2013) studied on intends to assess for undiagnosed depression and its predictors among adult diabetic patients. A Sample of 100 patients with type 2 diabetes mellitus attending the diabetic clinic of a tertiary care hospital was selected. Depression was assessed using Patient Health Questionnaire-9 (PHQ-9). Logistic regression was carried out to determine the predictors of depression and adjusted odds ratios with 95% confidence intervals were obtained. Subjects with diabetes are highly prone for co-morbid depression.[52]

Kankana Karpha et.al (2018) conducted research on Factors affecting depression and anxiety in diabetic patients. A prospective cohort study was conducted with 305 participants among which 152 were diabetic while 153 were nondiabetic patients. Depression and anxiety of the patients was measured through PHQ-9 scale and GAD-7 scale respectively. Founded that depression and anxiety are highly prevalent among diabetic patients. Factors like marital status, insulin therapy, retinopathy and ischemic heart disease are important predictors of depression

and anxiety among diabetic patients which require clinical attention. All diabetic patients while seeking clinical contact should be screened for depression and anxiety especially those patients with predisposing factors.[53]

Yatan Pal Singh Balhara et.al (2011) Conducted Research on Correlates of anxiety and depression among patients with type 2 diabetes mellitus. The instruments used included a semi-structured questionnaire, HbA1c levels, fasting blood glucose and postprandial blood glucose, Brief Patient Health Questionnaire, and Hospital Anxiety and Depression Scale (HADS). Founded that Monitoring of biochemical parameters like HbA1c and postprandial blood glucose levels and BMI could be a guide to development of anxiety in these patients. Also, physical exercise seems to have a protective effect on anxiety in those with type 2 diabetes mellitus.[54]

Subramani Poongothai et.al (2009) Researched on Prevalence of depression in a large urban South Indian population--the Chennai Urban Rural Epidemiology Study. Subjects were recruited from the Chennai Urban Rural Epidemiology Study (CURES), involving 26,001 subjects randomly recruited from 46 of the 155 corporation wards of Chennai (formerly Madras) city in South India.founded largest population-based study from India to report on prevalence of depression and shows that among urban south Indians, the prevalence of depression was 15.1%. Age, female gender and lower socio-economic status are some of the factors associated with depression in this population.[55]

Research Gap Analysis:

Most existing research in the field of Type 2 Diabetes Mellitus (T2DM) primarily concentrates on the prevalence of anxiety, depression, and stress in patients. However, there is a notable research gap in the area of comparative studies that specifically differentiate between early onset and late onset T2DM patients in terms of their experiences with these mental health issues. While prevalence studies are valuable, they do not provide insights into potential differences between these two groups. the research gap lies in the absence of comparative studies that focus on anxiety, depression, and stress in early onset vs late onset T2DM patients. Filling this gap will provide valuable insights for healthcare providers, researchers, to better support and manage the mental health needs of T2DM patients across different age groups.

Research questions:

Is there any differences in level of anxiety, depression and stress experienced by patients with early onset and late onset type 2 diabetes mellitus?

Aim:

The aim of this research is to comprehensively investigate and compare the levels of anxiety, depression, and stress in patients with Type 2 Diabetes Mellitus, with a specific focus on the differences between those with early onset and late onset of the condition.

Objectives:

To assess the level of anxiety, depression and stress among patients with early onset and late onset Type 2 diabetes mellitus.

To compare the level of anxiety, depression and stress among patients with early onset and late onset Type 2 diabetes mellitus.

The methodology section serves as the backbone of the study, offering a systematic framework for research question, aim, objective, study design, participant selection, statistical analysis. Here the study related to Diabetes Mellitus (T2DM), specifically focusing on anxiety, depression, and stress, with a comparative analysis between individuals with early and late onset of diabetes. The chosen design and comprehensive exploration of variables ensure a nuanced understanding of psychological well-being within different stages of T2DM onset. Inclusion criteria, sampling methods, and ethical considerations uphold the integrity of participant involvement. The subsequent data analysis, limitations acknowledgment, and adherence to ethical guidelines further strengthen the study's reliability.

Hypothesis:

Alternative Hypothesis [H_a] - There is a significant difference in the level of anxiety, depression, and stress between patients with early onset and late onset of Type 2 Diabetes Mellitus.

Null Hypothesis [H_0] - There is no significant difference in the level of anxiety, depression, and stress between patients with early onset and late onset of Type 2 Diabetes Mellitus.

Study Design:

This research employed a cross-sectional study design to investigate the psychological dimensions of patients with Type 2 Diabetes Mellitus (T2DM). A cross-sectional approach allows for the assessment of anxiety, depression, and stress levels at a specific point in time, providing valuable insights into the comparative aspects of these psychological variables among individuals with early onset and late onset diabetes.

Sample size:

The total sample size was determined using the prevalence rate obtained from the study titled "Anxiety, Depression, and Stress Among Patients with Type 2 Diabetes Mellitus: A Comparative Study of Early Onset and Late-Onset Diabetes" at a 76% confidence level. The formula employed for sample size calculation was $n = \frac{z^2 pv}{d^2}$ resulting in a total of 120 patients. This sample size was evenly divided, with 60 patients having early-onset Type 2 Diabetes Mellitus and 60 having late-onset Type 2 Diabetes Mellitus.

Table 1: Showing the total sample with gender wise distribution total population

Total Sample	120
Early onset diabetes	60
Early onset Male	30
Early onset Female	30
late onset diabetes	60
late onset Male	30
late onset Female	30

Sample collection method: Purposive sampling was employed to recruit participants for this study. This method involves selecting individuals based on specific criteria relevant to the research objectives. In this context, participants were chosen purposefully to represent the targeted age groups corresponding to early and late onset diabetes. This approach enables a focused examination of the psychological impact of diabetes at different stages, ensuring the inclusion of participants who meet the criteria essential for the comparative analysis.

Sampling location : This study has been conducted under the Department of Clinical Psychology in collaboration with the Department of General Medicine, Santosh Hospital Ghaziabad Delhi NCR.

Inclusion Criteria:

- Individuals aged 18 years and above with a confirmed diagnosis of Type 2 Diabetes Mellitus were taken for the study.
- Participants who were willing to participate and provided informed consent for the study were taken for this study purposes.
- Individuals with either early onset (diagnosed before the age of 45) or late onset (diagnosed after the age of 45) of Type 2 Diabetes Mellitus, were selected for study as determined by concerned physicians.
- Participants who were currently receiving treatment and care for their diabetes by concerned physicians were taken on priority basis under this study.

Exclusion criteria:

- Patients with a diagnosis of Type I Diabetes or any other form of diabetes were not taken this study.
- Patients with severe cognitive impairment - Dementia, Delirium and Substance use disorder, Schizophrenia (Functional and Organic) and bipolar disorder that may affect their ability to participate and provide accurate responses were excluded.
- Patients with known comorbidities such as renal disease and cardiovascular disease and Neurological disorder were also excluded from this study.

Test Measures

Before starting the data collection, the following standardized test measures are being administered:

1.Consent form (Annexure 1)

2. preliminary identification (Annexure 2)

3.General Health Questionnaire (GHQ) (12item) (Annexure 3)

4. Psychological wellbeing scale (18 item) (Annexure 4)

5. Depression anxiety and stress scale-42 (DASS-42) (Annexure 5)

Consent form

The consent form served as a crucial document in the study, ensuring adherence to ethical standards and promoting the voluntary nature of participants' involvement. Through the consent form, participants were provided with comprehensive information regarding the study's purpose, procedures, and potential risks and benefits. This transparency allowed individuals to make informed decisions about their participation, emphasizing their rights and well-being as paramount considerations in the research process.

Preliminary identification

The preliminary identification data form is designed to collect essential personal demographic information from participants. It includes details such as the duration of diabetes, type of treatment received, presence of comorbidities, educational qualifications, marital status, and any history of past or present psychological / Psychiatry problems or treatments.

General Health Questionnaire (GHQ): Developed by Goldberg in 1972, the General Health Questionnaire (GHQ) is a commonly used screening tool for the identification of common and mild mental disorders. Self-administered screening questionnaire GHQ-12 is used for all ages beginning in adolescence. In 2008, María del Pilar Sánchez-López et al. concluded that GHQ-12 can be used to identify non-psychotic psychiatric problems in adolescence and adulthood as well as to assess people's overall psychological well-being. Twelve items make up the GHQ-12, which is scored on a 4-point Likert scale. Possible answers include "less than usual," "no more than usual," "rather more than usual," and "much more than usual." Psychiatric impairment levels within and between samples should be compared using this scale. Its scoring method based on 4-point rating scale.

Psychological wellbeing scale (18 item)

Psychological wellbeing scale (1995) is shortened version of the original 42 item scale and was developed by Carol D. Ryff. It measures six criteria of psychological wellbeing, which are, autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The internal consistency (α) of the scale ranges from .93 to .86. Further, test–retest reliability ranges from .88 to .81.27

Depression anxiety and stress scale-42 (DASS-42)

Depression anxiety and stress scale was developed by Lovibond and in 1995. The DASS-42 is a 42 item self-report scale designed to measure the emotional states of depression, anxiety, and stress. The principal value of the DASS in a clinical setting is to clarify the locus of emotional disturbance, as part of the broader task of clinical assessment. Its scoring in based on rating scale (3 point).

Statistical Analysis:

Obtained data was analyzed by Statistical Packages for Social Sciences (SPSS, 23 versions). Descriptive statistics, including mean and standard deviation, were calculated for anxiety, depression, and stress scores within both early onset and late onset groups. Independent sample t-test was employed to compare the mean scores between the two groups, providing insights into potential differences in psychological outcomes. Additionally, correlation coefficients were computed to assess the strength and direction of the relationships between anxiety, depression, and stress scores within each group.

Ethical Considerations

The study received ethical approval from both the Ethics Committee of the Santosh Hospitals Ghaziabad and the Institutional Ethical committee of Santosh Deemed to be University, situated in Delhi NCR, India. Stringent measures were implemented to ensure the confidentiality and anonymity of the collected data. Informed consent was obtained from the legal guardians or responsible parties of the participants, along with collaboration and approval from relevant authorities associated with the study setting. Participants were explicitly informed about their right to withdraw from the research at any point, and no physical discomfort, harm, or adverse effects were caused during the course of the study. This research has the potential to contribute significantly by identifying early indicators of specific challenges in the target population, allowing for timely intervention strategies to be designed and implemented by educators and clinicians.

The objective of the present study was to evaluate and compare anxiety, depression, and stress among individuals with Type 2 Diabetes Mellitus (T2DM), specifically between those with early and late onset of the disease. Additionally, differences in general health, psychological well-being, and levels of anxiety, depression, and stress between early-onset and late-onset diabetes groups were calculated. An independent samples t-test, mean, standard deviation (SD), Pearson correlation, and graphical representations were utilized to analyse and illustrate the following results.

Table 2: Shows Age mean and SD among early onset and late onset diabetes

The table provides mean and standard deviation scores for individuals with early onset and late onset of Type 2 Diabetes Mellitus, categorized by gender. For those with early onset, both males and females.

Onset	*AGE*	*Mean*	*SD*	*N*
Early onset	Male	39.93	±4.23	30
	Female	39.67	±4.35	30
	Age	39.93	±4.23	60
Late onset	Male	56.65	±6.4	30
	Female	56.43	±6.52	30
	Total Age	56.65	±6.4	60

Table 3: Shows GHQ Score Mean and SD among Early and late onset diabetes

Table 3 displays General Health Questionnaire (GHQ) scores, assessing the mental health of individuals with early and late onset of Type 2 Diabetes Mellitus, categorized by gender.

ONSET	GHQ SCORE	MEAN	SD	N
EARLY ONSET	GHQ	14.71	±6.73	60
	Male	14.71	±6.73	30
	Female	15.46	±6.7	30
LATE ONSET	GHQ	13.2	±7.28	60
	Male	13.2	±7.28	30
	Female	12.73	±7.54	30

Figure 1: Shows GHQ Scoring among Early and Late onset Mean.

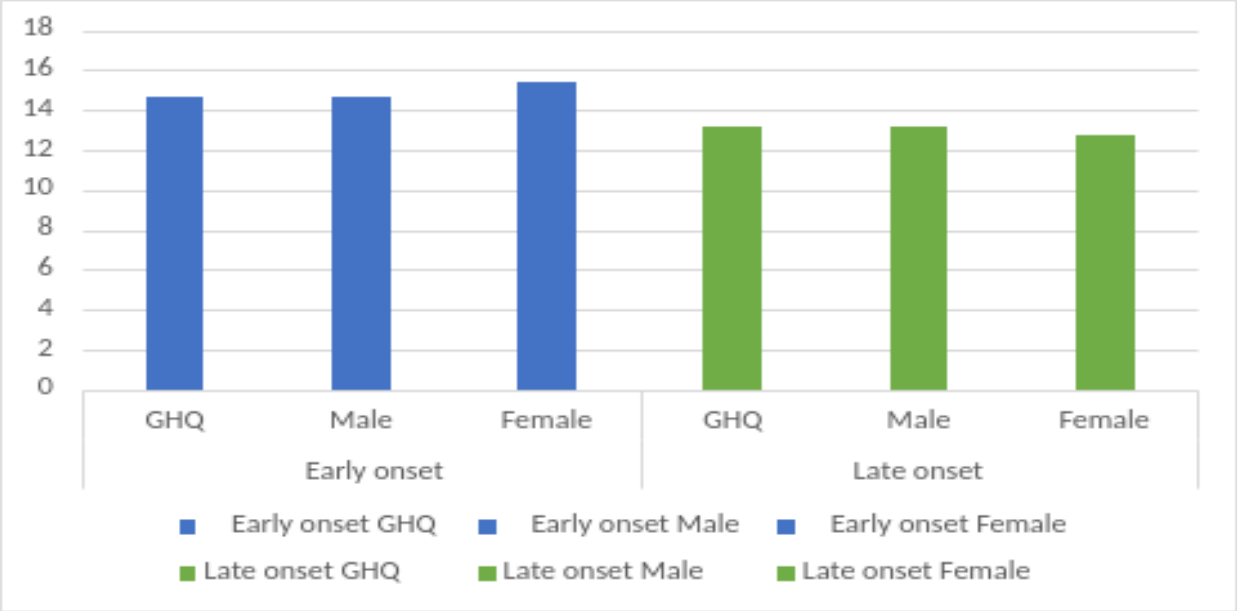


Table 4: Shows PWS Score Mean and SD among Early and late onset diabetes

Table 4 presents the results of the Psychological Well-Being Scale (PSW) questionnaire, indicating the psychological well-being of individuals with early and late onset of Type 2 Diabetes Mellitus, categorized by gender.

ONSET	PWS SCORE	MEAN	SD	N
EARLY ONSET	PWS	89.16	±13.81	60
	Male	89.16	±13.81	30
	Female	87.39	±12.76	30
LATE ONSET	PWS	87.81	±13.12	60
	Male	87.81	±13.12	30
	Female	87.02	±13.59	30

Figure 2: shows Early onset and late onset psychological well-being scale mean.

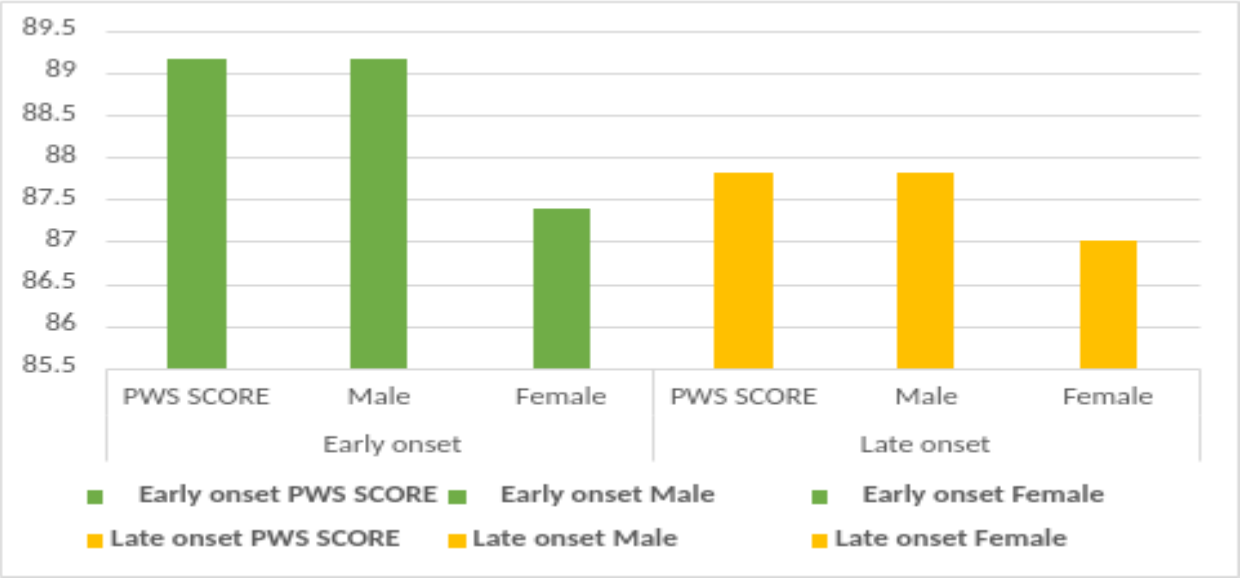
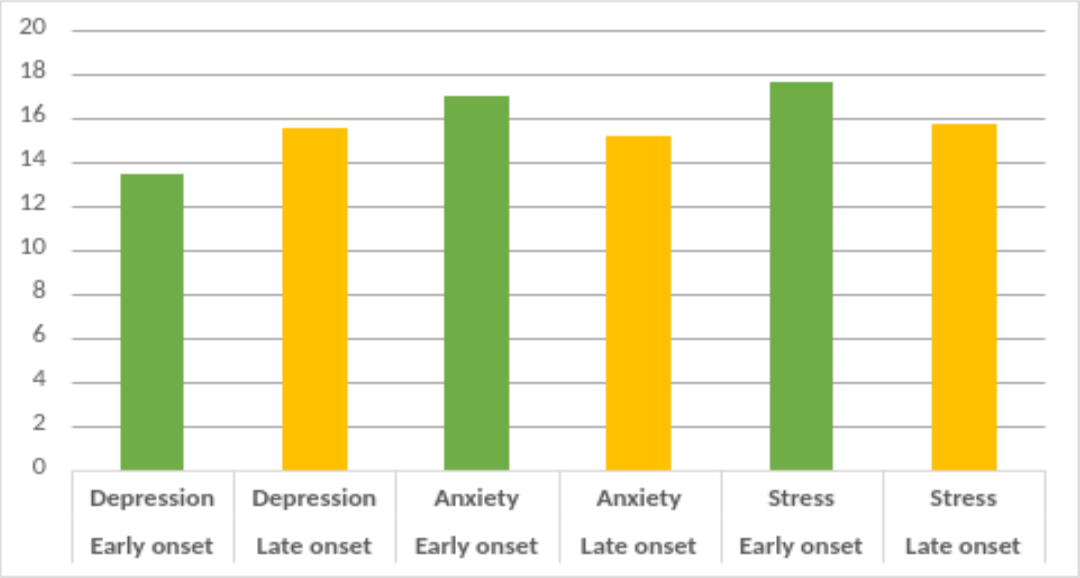


Table 5: Showing anxiety, depression, stress mean and SD level among early and late onset diabetes mellitus.

The Depression, Anxiety, and Stress Scale (DASS) scores in Table 5 provide a comprehensive view of the psychological well-being of individuals with early and late onset of Type 2 Diabetes Mellitus, classified by gender.

Onset	*Variable*	*DASS Score*	*Mean*	*SD*	*N*
Early onset	Depression	Total	13.46	±6.38	60
		Male	13.46	±6.38	30
		female	14.14	±6.25	30
	Anxiety	Total	17.01	±7.19	60
		Male	15.16	±7.19	30
		Female	17.6	±7.46	30
	Stress	Total	17.65	±8.07	60
		Male	17.65	±8.07	30
		Female	18.54	±8.34	30
Late onset	Depression	Total	15.48	±7.22	60
		Male	15.48	±7.22	30
		Female	14.83	±7.09	30
	Anxiety	Total	15.16	±7.12	60
		Male	15.16	±7.12	30
		Female	15.44	±7.42	30
	Stress	Total	15.71	±9.08	60
		Male	15.71	±9.08	30
		Female	9.08	±9.36	30

Figure 3 showing Early onset and late onset diabetes Anxiety, Depression and stress level.



Tabel 6: Shows the results of the independent sample t-test, illustrating the mean differences between early and late onset groups

Table 6 shows mean standard deviation and t test of GHQ, PWS and DASS among early and late onset diabetes. The findings show statistically significant differences ($p < 0.05$) between the working and non-working groups.

Variable	*Onset*	*N*	*Mean*	*SD*	*t test*	*df*
GHQ	Early onset	60	14.71	±6.73	1.184	118
	Late onset	60	13.2	±7.28		
PWS	Early onset	60	89.16	±13.81	0.549	118
	Late onset	60	87.81	±13.12		
Depression	Early onset	60	13.46	±6.38	1.621	118
	Late onset	60	15.48	±7.22		
Anxiety	Early onset	60	17.01	±7.19	1.415	118
	Late onset	60	15.16	±7.12		
Stress	Early onset	60	17.65	±8.07	1.232	118
	Late onset	60	15.71	±9.08		

Table 7: Shows the results of Pearson correlation between GHQ & all variables (PSW, Depression &anxiety and stress)

Variable	*GHQ*	*PWS*	*Depression*	*Anxiety*	*Stress*
GHQ	1	.232*	.615**	.596**	.625**
PWS		1	0.132	0.154	.231*
Depression			1	.599**	.709**
Anxiety				1	.608**
Stress					1

Transitioning from the results section to the discussion phase, this chapter serves as a critical examination of the numerical outcomes derived from our investigation into anxiety, depression, and stress among individuals with Type 2 Diabetes. The ensuing dialogue endeavours to contextualize these quantitative manifestations, delving beyond statistical representations to elucidate the nuanced implications inherent in our data. The subsequent discourse not only encapsulates a meticulous consideration of scores but also engages in a profound analysis, affording a comprehensive understanding of the psychological dimensions tethered to Type 2 Diabetes.

The findings are discussed as per different phases.

Phase 1 (Tabel 1 & 2)

Demographic details of the entire group (120 total samples) were equally distributed gender-wise. Refer to Tables 1 and 2 for more information.

Phase 2

GHQ interpretation (Table 3 & Figure 1)

Through GHQ, an attempt was made to identify health issues, and it is evident that both groups, whether with early or late onset diabetes, are at risk. Individuals with early onset diabetes exhibit a discernible level of psychological distress. While both males and females show indications of distress, there is a nuanced gender difference, with females tending to report slightly higher psychological distress compared to their male counterparts.

In the late onset diabetes group, an observable yet comparatively lower level of psychological distress is noted. This suggests that, on average, individuals with late onset diabetes experience a moderated psychological impact. Gender distinctions within this group reveal subtle variations, with females reporting slightly lower psychological distress compared to males.

The study conducted by **Gilang Bhaskara (2022)** found that the prevalence of diabetes distress is predominantly associated with type 2 diabetes mellitus. The study suggests that screening for diabetes-related distress and regular health promotion, focusing on the relationship between diabetes and psychological well-being, may be a great potential action to improve public health and patient outcomes[56].

The findings underscore the complex interplay between the timing of diabetes onset and psychological well-being. Notably, individuals with early onset diabetes appear to grapple with a heightened level of psychological distress, while those with late onset diabetes demonstrate a more moderated impact. Gender nuances within each onset group further emphasize the need for a nuanced, gender-sensitive approach when addressing the psychological dimensions of Type 2 Diabetes Mellitus. The study was conducted by **C. Li** (2017) found that psychological distress was an independent risk factor for the development of Type 2 diabetes mellitus (T2DM)[57].

Phase 3

PWS interpretation (Table 4 & Figure 2)

PWS Interpretation:

In analysing the Psychological Well-Being Scale (PWS) within the framework of early and late onset diabetes, while considering gender distinctions, discernible insights emerge.

Early Onset:

Individuals with early onset diabetes display a notable moderately positive impact on their psychological well-being. Both males and females within this category demonstrate comparable and high levels of psychological well-being. This emphasizes the substantial psychological resilience exhibited by those with early onset diabetes.

Late Onset:

In the late onset diabetes group, there is a slightly lower, yet positive, impact on psychological well-being. Gender nuances within this group are subtle, suggesting that both males and females experience psychological well-being at comparable positive levels. The marginal difference in psychological well-being between early and late onset groups is noticeable but relatively minor.

The research findings were supported by the study conducted by **Mark Peyrot (2019),** which focused on psychological well-being and diabetes-related distress in various states of Type 2 diabetes. The study found that well-being and distress levels varied across states, as defined by the nature and timing of diagnoses and medications.[58]

The findings emphasize the overarching influence of diabetes on moderately positive psychological well-being, regardless of the onset timing. While early onset individuals exhibit a slightly higher positive impact, the distinction is nuanced. This underscores the importance of addressing and nurturing positive psychological well-being as a pivotal aspect of holistic care for individuals with Type 2 Diabetes Mellitus.

Recognizing potential variations based on onset timing and gender differences is crucial in promoting a comprehensive approach to mental health and well-being in diabetes management. The study conducted by **Mangalapalli Tirumalesh et al**. (2017) revealed that type 2 diabetic patients experience moderate psychological well-being. Additionally, the study reveals that individuals who regularly practice exercises have good psychological well-being compared to those who do not practice exercises.[59]

Phase 4

Depression interpretation (Table 5 & Figure 3)

The exploration of depression levels within the context of Type 2 Diabetes Mellitus, employing the Depression Anxiety Stress Scales (DASS-42), unveils nuanced distinctions between early and late onset diabetes, with a consideration of gender influences.

Early Onset Diabetes:

Individuals diagnosed with early onset diabetes present with depression scores indicative of moderate levels. The uniform scores among males and females in this group spotlight the pervasive nature of depression, illustrating the profound psychological toll exacted by early onset diabetes.

Late Onset Diabetes:

The cohort with late onset diabetes manifests slightly elevated depression scores, remaining within the moderate range but edging closer to higher depression levels. This group exhibits minimal gender variance in depression scores, suggesting a broadly shared psychological burden among both males and females affected by late onset diabetes.

These results are supported by **Kellee Poulsen et al. (2011)**, who studied Depression and Anxiety in Older and Middle-aged Adults with Diabetes. The study found that older adults with diabetes had significantly lower levels of anxiety and diabetes-related distress than middle-aged adults with diabetes.[60]

comparing early and late onset depression underscores a statistical trend but does not meet conventional thresholds for significant differences. This indicates that while there are observable differences in depression scores between early and late onset groups, they are not statistically significant at conventional levels. This nuanced finding suggests both groups are comparably vulnerable to depression, albeit with a slight upward trend in the late onset group.

The study by **Mijung Park et al. (2016)** on Depression among older adults with late-onset diabetes mellitus supports my research. The study found that diabetes mellitus (DM) and depression are frequently comorbid in older adult patients. Considering the negative synergistic effects on a range of health outcomes resulting from comorbid depression and DM, prevention and early treatment of comorbid depression are critical components of successful health management in older adult patients with DM.[61]

The findings on depression are inclined towards a moderate level of depression, regardless of whether it is early onset or late onset diabetes mellitus. Being diabetic makes individuals health-wise more vulnerable to depression.

The analysis reveals that depression, as a component of the psychological impact of Type 2 Diabetes Mellitus, is a significant concern for both early and late onset groups, with a marginal but not statistically significant higher prevalence in the late onset group. Currently, the moderate level of depression, if not addressed, means this population might develop signs and symptoms of depression later. The moderate levels of depression across both groups highlight the critical need for integrating mental health support into diabetes care protocols. Recognizing and addressing the mental health challenges faced by individuals with diabetes, regardless of the onset timing or gender, is paramount for improving quality of life and treatment outcomes. Tailored psychological interventions and regular mental health screenings should be integral components of comprehensive diabetes management strategies.

Anxiety interpretation (Table 5 & Figure 3)

In this segment of the study, we delve into the anxiety component as measured by the Depression Anxiety Stress Scales (DASS-42) among individuals with Type 2 Diabetes Mellitus, differentiating between early and late onset diabetes, while also considering gender-based difference.

Early Onset Diabetes:

The anxiety scores for individuals with early onset diabetes are notable, reflecting higher levels of anxiety overall. Females in this group exhibit slightly higher anxiety scores compared to males, indicating a gender-specific impact where women may experience more pronounced anxiety symptoms. The study conducted by **J. L. Browne et al. (2014)** on anxiety, and self-care behaviours of young adults with Type 2 diabetes, as part of the International Diabetes Management and Impact for Long-term Empowerment and Success (MILES) Study, supports my research. The findings indicate that young adults with Type 2 diabetes may require more intensive psychological and self-care support than their older counterparts.[62]

Late Onset Diabetes:

For individuals with late onset diabetes, the anxiety scores are somewhat lower compared to the early onset group. The scores between males and females in this group are more closely aligned, suggesting a less pronounced gender difference in the experience of anxiety.

when comparing anxiety levels between early and late onset groups suggests a discernible difference, though this difference does not reach statistical significance at conventional levels. This finding indicates that while there is a trend towards higher anxiety in the early onset group, the difference in anxiety levels between the two groups is not substantial enough to be considered statistically significant. The study by **Shengxin Liu et al. (2022)** on Early-Onset Type 2 Diabetes and Mood, Anxiety, and Stress-Related Disorders supports my research.

The study found that early-onset type 2 diabetes is associated with a higher risk of anxiety and stress-related disorders. [63]

The analysis shows that anxiety is a prevalent concern among individuals with Type 2 Diabetes Mellitus, with a slight trend towards higher anxiety levels in those diagnosed at an earlier age. However, the absence of a statistically significant difference suggests that anxiety is a common issue across both early and late onset diabetes, necessitating attention and intervention.

Stress interpretation (Table 5 & Figure 3)

In exploring the stress levels among individuals with Type 2 Diabetes Mellitus through the lens of the Depression Anxiety Stress Scales (DASS-42), a distinction is drawn between those with early and late onset diabetes.

Early Onset Diabetes:

Participants with early onset diabetes displayed higher stress scores, indicating a significant burden of stress within this group. The stress levels between males and females in this category are closely matched, though females report slightly higher levels, suggesting that stress affects both genders profoundly, with women experiencing a marginally greater impact. The study conducted by **A. Bo et al. (2019)** on the prevalence and correlates of diabetes distress and perceived stress symptoms among adults with early-onset Type 2 diabetes found a high prevalence of emotional problems in this group in Denmark. The researchers suggest that healthcare for these individuals should focus on both physical health and psychosocial circumstances, addressing both general and diabetes-specific emotional problems.[64]

Late Onset Diabetes:

The group with late onset diabetes reported lower stress scores compared to their early onset counterparts. Remarkably, the stress scores for females in the late onset group showed a significant deviation, being much lower than expected. This indicates a varied response to stress within the late onset group, potentially reflecting different coping mechanisms or variations in the stressors experienced.

while indicating a difference in stress levels between early and late onset groups, suggests that this difference is not statistically significant. This points to a nuanced but not markedly distinct stress impact across the onset categories of diabetes.

This study supported my findings. **M. Faulenbach et al. (2012)** conducted research on the effect of psychological stress on glucose control in patients with Type 2 diabetes. They found that when stress is experienced in the postprandial period, acute psychological stress significantly increases glucose concentrations in patients with Type 2 diabetes.[65]

In conclusion, both groups, whether early or late onset, are found to be sensitive in maintaining their general health status. This means that both groups are vulnerable in terms of health. When compared on psychological variables such as depression, anxiety, and stress, both groups were found to exhibit significant levels of depression, anxiety, and stress. Additionally, when these psychological variables were examined to identify correlations, a significant positive correlation was found between the General Health Questionnaire (GHQ) scores and depression (.62), anxiety (.60), and stress (.63). This indicates that greater health complications are associated with higher levels of depression, stress, and anxiety in patients.

In the last section, we covered the main discoveries, conclusions, and ideas for the future. We looked at what we found from our analysis and drew conclusions based on the main trends we saw. The discoveries and conclusions were presented in the same order as our research goals and the things we wanted to find out. After talking about the findings and conclusions, we also gave some suggestions, both for academic purposes and practical use. We based these on the analysis and interpretation of our results. This chapter is all about showing what we found, acknowledging the study's limitations, and giving ideas for more research in the same field.

General Health Questionnaire (GHQ):

Early Onset: Individuals diagnosed with diabetes at an earlier age demonstrated slightly higher General Health Questionnaire (GHQ) scores compared to those with a late onset. Although the difference is not statistically significant, it suggests a subtle variation in psychological well-being.

Late Onset: Conversely, participants with late onset diabetes showed slightly lower GHQ scores, hinting at a potential difference in how psychological factors manifest in comparison to their early onset counterparts.

The elevated scores on the General Health Questionnaire (GHQ) among individuals with early onset diabetes indicate higher levels of overall psychological distress. This could be due to the cumulative effect of managing diabetes from a young age, as well as the potential impact of the condition on various aspects of life, including social relationships, work, and daily activities. The combination of these stressors may contribute to the higher psychological distress reported in this group. explain more why higher-level score in early onset reasons and late onset lower level scores reasons

Psychological Well-Being Scale (PSW):

Early Onset: Participants with early onset diabetes exhibited slightly higher scores on the Psychological Well-Being Scale (PSW) than those with late onset.

Late Onset: Late onset individuals, on the other hand, demonstrated slightly lower scores on the PSW. The non-significant difference suggests a subtle divergence in how psychological well-being is experienced in the late onset group.

The higher scores on the Psychological Well-Being Scale (PSW) among individuals with early onset diabetes may suggest that despite the challenges they face, they have developed effective coping mechanisms and resilience over time. This resilience could stem from factors such as strong social support networks, adaptive coping strategies, and a proactive approach to managing their condition. In contrast, individuals with late onset diabetes may struggle to adjust to the diagnosis later in life, leading to lower scores on the PSW.

Depression:

Early Onset: Individuals diagnosed with diabetes at an earlier age reported generally lower levels of depression compared to those with late onset. The trend implies that the psychological impact of diabetes on depression might be less pronounced in the early onset group.

Late Onset: Late onset participants tended to exhibit slightly higher depression scores, hinting at a potential difference in how depression manifests in individuals diagnosed with diabetes later in life.

the higher levels of depression seen in individuals with late onset diabetes may stem from different sources. As people age, they may experience a decline in physical health, mobility issues, and increased reliance on medications, all of which can contribute to feelings of sadness

and hopelessness. Furthermore, late onset diabetes may coincide with other age-related challenges such as retirement, loss of social connections, or the onset of other health problems, which can further exacerbate depressive symptoms.

Anxiety:

Early Onset: Those with early onset diabetes displayed a slight inclination toward higher anxiety levels than their late onset counterparts. The observed trend suggests that anxiety experiences might vary based on the timing of diabetes onset.

Late Onset: Late onset participants showed a subtle tendency toward lower anxiety scores, indicating a potential distinction in anxiety experiences between early and late onset diabetes.

The higher levels of anxiety and stress observed in individuals with early onset diabetes may be attributed to several factors. Firstly, being diagnosed with a chronic condition at a younger age can be overwhelming and may lead to increased worry about the future, fear of complications, and uncertainty about managing the condition effectively. Additionally, young adults with diabetes often face lifestyle adjustments such as dietary restrictions, medication adherence, and regular monitoring,

Stress:

Early Onset: Individuals with early onset diabetes demonstrated a slight leaning toward higher stress levels compared to late onset individuals.

Late Onset: Late onset participants tended to have slightly lower stress scores, suggesting a potential variation in stress experiences.

The higher stress levels observed in individuals with early onset diabetes may result from the challenges associated with managing a chronic condition from a young age. These challenges include adapting to lifestyle changes, concerns about future complications, and psychosocial impacts on academic and social functioning. Overall, the cumulative effect of these factors contributes to heightened stress levels in early onset diabetes compared to late onset cases.

Overall, the study highlights the nuanced psychological experiences of individuals with type 2 diabetes mellitus, with variations observed between early and late onset cases. Early onset diabetes appears to be associated with higher levels of anxiety, stress, and overall psychological distress, possibly due to the challenges of managing the condition from a young age. Late onset diabetes, on the other hand, may be linked to higher levels of depression, possibly stemming from age-related factors and struggles with adjusting to the diagnosis later in life. These findings underscore the importance of considering the timing of diabetes onset when addressing psychological well-being in patients with T2DM. Further research and targeted interventions are warranted to better understand and address the psychological needs of individuals living with diabetes across the lifespan.

Limitation:

The study comparing anxiety, depression, and stress among early and late onset Type 2 Diabetes Mellitus (T2DM) patients faces several limitations. Socioeconomic disparities present challenges, as patients from lower socioeconomic backgrounds may struggle to engage with psychological assessments due to limited resources. Additionally, a tendency to prioritize medical laboratory tests over psychological evaluations reflects a lack of awareness of mental health's importance in diabetes management, potentially introducing selection bias. Educational barriers further complicate matters, with participants' limited literacy hindering their ability to understand and respond to test questions accurately. The cross-sectional design limits causal inference, necessitating longitudinal research to understand the dynamic interplay between diabetes onset and psychological distress. Reliance on self-report measures introduces potential response bias, particularly in populations with low health literacy. Addressing these limitations requires culturally sensitive assessment tools and support for participants from diverse backgrounds to ensure reliable data interpretation and meaningful insights.

Future Research and suggestion

- More research is needed to focus on the relationship between factors as well as overall health anxiety, depression and certain other stress-related disorders, namely, gastrointestinal disorders (including IBS), respiratory disorders, dermatological disorders, musculoskeletal disorders, hypertension and affective disorders.
- The efficacy of the intervention program should be studied on larger, different samples to draw further generalizations. This may include rural samples, samples from other cities in India, and samples from other countries. Psychological aspects can be assessed and incorporated into the intervention program.
- Longitudinal research is needed to understand a better picture of diabetes.

Implication

- The findings of this study offer valuable insights that can contribute to a better understanding of diabetic patients and aid in their training and counselling.
- The findings should draw the attention of health professionals, counsellors, government, and non-government bodies towards the management of diabetic persons, emphasizing the need for integrated care that addresses both physical and mental health aspects.
- Healthcare professionals should be vigilant for signs of psychological distress in diabetic patients, highlighting the importance of comprehensive care that encompasses both physical and mental health concerns.

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ANNEXURE I

SANTOSH MEDICAL COLLEGE & HOSPITALS

No.1 AMBEDKAR ROAD, GHAZIABAD, UP

Department of Clinical Psychology

Consent form

Patient Name: **Date:**

OPD No: **Age:**

You are requested to participate in a research study titled, **"Anxiety, Depression and Stress Among Patients with Diabetes Mellitus A Comparative Study of Early Onset and Late Onset Diabetes''** is to be conducted in the Department of Clinical Psychology. Your voluntary participation in this study is important. If you want to withdraw you can do at any time. **This study is free of cost**. The information obtained from you during the study will be kept confidential and will only be used to fulfil the objective of the study. If you have any question regarding the study, feel free to ask**.**

I _____agree to participate voluntarily in the study

Participant name: **Date:**

Participant Signature:

Investigator: Mr. Sakthivel M, MSc Clinical Psychology 2nd year student.

Research guide: Dr. Rani Srivastava - Prof & Head of dept of clinical psychology SMCH (Santosh Deemed to be university

Research co-guide: Dr.Ashok Kumar – Prof & Head of dept of General Medicine SMCH (Santosh Deemed to be university)

Research co-guide: Dr.Brijesh Saran – Associate Prof of dept of Psychiatry SMCH (Santosh Deemed to be university)

ANNEXURE II

SANTOSH
Deemed to be University

Celebrating 25+ Impactful years Since 1990

संतोष मेडिकल कॉलेज, अस्पताल

नैदानिक, मनोवैज्ञानिक विभाग

सहमति पत्र

रोगी का नाम :- दिनांक:-

बाध्य रोगी नo:- उम्र :-

आपसे अनुरोध है कि नैदानिक मनोविज्ञान विभाग में होने वाले शोध जिसका विषय " शुरू में व बाद में होने वाले मधुमेह रोगियों में चिंतन, अवसाद , व तनाव का तुलनातमक अध्ययन " में अपना सहयोग प्रदान करे। आपकी स्वीकृति इस अध्ययन के लिए आवश्यक है। यदि आप इस अध्ययन को छोड़ना चाहे तो किसी भी समय छोड़कर जा सकते हैं। इस अध्ययन में भागीदारी के लिए आपसे कोई शुल्क नहीं लिया जाएगा व शोध के अंतरगत प्राप्त की गई जानकारी को गुप्त रखा जाएगा व शोध के लिए ही उपयोग किया जाएगा। यदि इस विषय में आप कुछ और जानकारी प्राप्त करना चाहते हैं तो आप स्वतंत्र रूप से प्राप्त कर सकते हैं।

मैं _____, इस अध्ययन में अपनी सहभागिता देने के लिए सहमत हूँ।

सेहयोगी का नाम : दिनांक :

सहयोगी के हस्ताक्षर :

निरीक्षक :

श्री मान शक्तिवेल (द्वितीय वर्ष, परास्नातक नैदानिक मनोविज्ञान छात्र)

डॉ. रानी श्रीवास्तव (प्रोफेसर एवम् विभागाध्यक्ष नैदानिक मनोविज्ञान विभाग,)

डॉ.अशोक कुमार (प्रोफेसर एवम् विभागाध्यक्ष सामान्य चिकित्सा विभाग,)

डॉ.ब्रिजेश सरन (प्रोफेसर , मनोरोग विभाग

ANNEXURE III

SANTOSH MEDICAL COLLEGE & HOSPITALS

No.1 AMBEDKAR ROAD, GHAZIABAD, UP

Department of Clinical Psychology

Preliminary Identification Form

Performa for preliminary identification details **"Anxiety, Depression and Stress in Patients with type 2 Diabetes Mellitus: A Comparative Study of Early Onset and Late Onset''.**

Patient Name: **OPD:** **Age:**

Address:

Mobile number:

I- Age in Years

A)18-30
B) 30-40
C)41-50
D) 51-60
E) 65 above

II- Gender

A) Male
B) Female
C)others

IV- Qualification

A) No formal Education
B) Primary School
C) Secondary School
D)Higher Secondary Education
E) Graduates and above

V- socio economic status

A) upper middle class
B) Middle class
C) Lower middle class

VI- Occupation

A) Government employee
B) Private employee
C) self employed
D) Retired
E) Housewife

VII- Religion

A) Hindu
B) Christian
C) Muslim
D) Others

VIII Duration of Type-II Diabetes in years

A)0-5
B) 6-10
C) 11-15
D)16-20
E) Above 20

IX Type of Treatment

A) Oral Hypoglycaemic Drugs (OHD)
B) Insulin
C) Insulin and OHD

ANNEXURE IV

GENERAL HEALTH QUESTIONNAIRE (GHQ)-12

INSTRUCTIONS: We should like to know if you have any medical complaints and how your health has been in general, over the past few weeks. We want to know about present and recent complaints, not those you had in the past.

Q NO 1, 3, 4, 7, 8, 12 is positively scored item & 2, 5, 6, 9, 10, 11 is negatively scored item.

SNO	PERTICULARS	always	often	Sometimes	never
1	Able to concentrate	0	1	2	3
2	Lost much sleep over worry	3	2	1	0
3	Playing a useful part	0	1	2	3
4	Felt capable of making decisions	0	1	2	3
5	Felt constantly under strain	3	2	1	0
6	Could not come over to difficulties	3	2	1	0
7	Able to enjoy day-to-day activities	0	1	2	3
8	Able to face up to your problems	0	1	2	3
9	Feeling unhappy and depressed	3	2	1	0
10	Been losing confidence in yourself	3	2	1	0
11	Thinking of self as worthless person	3	2	1	0
12	Feeling reasonably happy all things considered	0	1	2	3

ANNEXURE V

DEPARTMENT OF CLINICAL PSYCHOLOGY

PSYCHOLOGICAL WELLBEING SCALE

SNo	items	1 = strongly agree;	2 = somewhat agree;	3 = a little agree	4 = neither agree or disagree;	5 = a little disagree;	6 = somewhat disagree;	7 = strongly disagree
1	"I like most parts of my personality."	7	6	5	4	3	2	1
2	"When I look at the story of my life, I am pleased with how things have turned out so far."	7	6	5	4	3	2	1
3	"Some people wander aimlessly through life, but I am not one of them."	7	6	5	4	3	2	1
4	"The demands of everyday life often get me down."	1	2	3	4	5	6	7
5	"In many ways I feel disappointed about my achievements in life."	1	2	3	4	5	6	7
6	"Maintaining close relationships has been difficult	1	2	3	4	5	6	7

	and frustrating for me."							
7	"I live life one day at a time and don't really think about the future."	1	2	3	4	5	6	7
8	"In general, I feel I am in charge of the situation in which I live."	7	6	5	4	3	2	1
9	"I am good at managing the responsibilities of daily life."	7	6	5	4	3	2	1
10	"I sometimes feel as if I've done all there is to do in life."	1	2	3	4	5	6	7
11	"For me, life has been a continuous process of learning, changing, and growth."	7	6	5	4	3	2	1
12	"I think it is important to have new experiences that challenge how I think about myself and the world."	7	6	5	4	3	2	1
13	"People would describe me as a giving person, willing to share my time with others."	7	6	5	4	3	2	1
14	"I gave up trying to make big improvements or	1	2	3	4	5	6	7

	changes in my life a long time ago"							
15	"I tend to be influenced by people with strong opinions"	1	2	3	4	5	6	7
16	"I have not experienced many warm and trusting relationships with others."	1	2	3	4	5	6	7
17	"I have confidence in my own opinions, even if they are different from the way most other people think."	7	6	5	4	3	2	1
18	"I judge myself by what I think is important, not by the values of what others think is important."	7	6	5	4	3	2	1

ANNEXURE VI

DASS

Name: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found myself getting upset by quite trivial things	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I just couldn't seem to get going	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I had a feeling of shakiness (eg, legs going to give way)	0	1	2	3
8	I found it difficult to relax	0	1	2	3
9	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting upset rather easily	0	1	2	3
12	I felt that I was using a lot of nervous energy	0	1	2	3
13	I felt sad and depressed	0	1	2	3
14	I found myself getting impatient when I was delayed in any way (eg, elevators, traffic lights, being kept waiting)	0	1	2	3
15	I had a feeling of faintness	0	1	2	3
16	I felt that I had lost interest in just about everything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life wasn't worthwhile	0	1	2	3

Reminder of rating scale:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

22	I found it hard to wind down	0	1	2	3
23	I had difficulty in swallowing	0	1	2	3
24	I couldn't seem to get any enjoyment out of the things I did	0	1	2	3
25	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
26	I felt down-hearted and blue	0	1	2	3
27	I found that I was very irritable	0	1	2	3
28	I felt I was close to panic	0	1	2	3
29	I found it hard to calm down after something upset me	0	1	2	3
30	I feared that I would be "thrown" by some trivial but unfamiliar task	0	1	2	3
31	I was unable to become enthusiastic about anything	0	1	2	3
32	I found it difficult to tolerate interruptions to what I was doing	0	1	2	3
33	I was in a state of nervous tension	0	1	2	3
34	I felt I was pretty worthless	0	1	2	3
35	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
36	I felt terrified	0	1	2	3
37	I could see nothing in the future to be hopeful about	0	1	2	3
38	I felt that life was meaningless	0	1	2	3
39	I found myself getting agitated	0	1	2	3
40	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
41	I experienced trembling (eg, in the hands)	0	1	2	3
42	I found it difficult to work up the initiative to do things	0	1	2	3

LETTER OF ETHICAL CLEARANCE

SANTOSH
Deemed to be University
(Established u/s 3 of the UGC Act, 1956)

F. No. SU/R/2024/1344[43] Dated: 17.05.2024

Subject: Grant of Ethical Clearance for **Dissertation Protocol** Topic **"Anxiety, Depression and Stress",** submitted by **SAKTHIVEL M,** student of M.Sc CLINICAL PSYCHOLOGY, 2022 Batch.

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With reference to the request for grant of Ethical Clearance for the Dissertation Protocol entitled **"Anxiety, Depression and Stress"**, **SAKTHIVEL M** is informed that the **Dissertation Protocol** submitted by him/her was considered by the **Screening Committee** of the **Allied Health Sciences** in its meetings held on 07.02.2024 and 29.02.2024. The recommendations of the **Screening Committee** were considered in detail by the **Institutional Ethics Committee** in its meeting held on **15.05.2024** and the same was **approved** by the **Ethics Committee** of the **Santosh Deemed to be University, Ghaziabad, Delhi NCR**.

He /She is informed accordingly for further necessary action.

17/5/24

[Dr. EZHILRAJAN. K]
REGISTRAR

REGISTRAR

SAKTHIVEL M
M.Sc CLINICAL PSYCHOLOGY.

Copy to:

1. The Vice Chancellor
2. The Dean – Academics
3. The Dean, SMC&H
4. The Dean – Research
5. The Director - IQAC
6. HOD/ Course In-charge of the concerned Department.

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STATISTICIAN CERTIFICATE

This is to certify that the statistical analysis component of the thesis titled **"Anxiety Depression and Stress among Patients With type 2 Diabetes Mellitus A Comparative Study of Early And Late Onset Diabetes"** done by Sakthivel M in the Department of Clinical Psychology Santosh Medical College and Hospital, Ghaziabad, has been conducted under my direct guidance and supervision.

All the statistical calculations of this study are authentic and correct to the best of my knowledge.

Wish him all the success in his life.

Assistant Professor cum Statistician

Santosh Deemed To be University, Ghaziabad

PLAGIARISM CERTIFICATE

Master Chart